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ABSTRACT

The present study tested four predictions concerning the effects of instructional objectives as an adjunct aid in learning through the lecture method. First, the inclusion of objectives with the lecture was postulated to result in greater learning from the lecture. Second, objectives presentation by subsets was predicted to facilitate performance more than presentation by the total set prior to the lecture. Third, it was hypothesized that the provision of objectives would have an effect on performance measured by verbatim, but not paraphrase, items. Finally, the prediction was made that a more positive attitude would be associated with an instructional presentation containing objectives than one without objectives. Data was obtained through lecture treatment of 60 undergraduate students enrolled in an introductory educational psychology class. Subjects were randomly assigned to one of four lecture treatment groups. Data analysis revealed that the provision of objectives facilitated learning, but presenting these objective by subsets had no advantage over presenting the entire set at once. Achievement with verbatim items was greater than paraphrase items, and the provision of objectives facilitated learning on verbatim but not paraphrase items. The inclusion of objectives with the lecture resulted in a more positive student attitude. (Author/MJB)

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Presentation of Instructional Objectives
by Set or Subsets in Learning from Lecture

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A major purpose of the present study was to compare the effects of presenting instructional objectives by the total set or two subsets on learning from lecture. To determine the extent of achievement from the lecture, learning was measured by both verbatim and paraphrase test items. Additionally, this study sought to determine if the provision of objectives with the lecture would have an influence on student attitude.

Several studies have demonstrated that the provision of instructional objectives facilitates learning from a lecture (Royer, 1977; Kaplan & Burgin, Note 1; and Tiemann, Note 2). While much research has been conducted on efficient means for the deployment of objectives, questions and other adjunct aids in learning from text, little is known about their efficient use with lectures. Furthermore, the study by Royer (1977) illustrated that different effects can be obtained from the use of objectives in a lecture than those obtained from their analogous use with textual material. Therefore, further study of objectives as adjunct aids with lectures is needed if they are to be utilized in an efficient manner.

In discussing the distinction between oral and written prose, Kaplan and Burgin (Note 1) described several characteristics of oral prose that suggest a basis for improving upon the deployment of objectives in a lecture. Oral prose is characterized by a constant rate of presentation and a linear flow of information.

As a result of the constant rate of presentation, it is probable that many learners miss important information because it was presented too fast for their information-processing capabilities. With the linear flow of information there is a continuing sequence of information which does not allow the learner to review information. So, learning from a lecture places strenuous demands upon the information-processing system of the learner especially when note taking does not occur. In this case the learner must attempt to place important information in memory storage while simultaneously continuing the search/selection process for more important information.

A list of objectives with a lecture, especially a large list of specific objectives, could actually add to the learner's already large memory load. Kaplan (1974) found that presentation of objectives by subsets resulted in greater intentional learning of textual information than presentation at once of the entire set. Due to the nature of information-processing in learning from lecture as outlined above, it was predicted that the advantage for presentation of objectives by subsets obtained with written prose would also hold for oral prose. Further support for this contention is found in research on inserted questions in learning from written prose. Anderson and Biddle (1975) concluded the closer a question is to its referent information, the more likely it is that a correct response will be given to that question on a later criterion test. Here, presenting objectives by subsets within the lecture as opposed to the total list prior

to the lecture can be viewed as being comparable to a more frequent interspersion of questions.

The second purpose of this study related to the level of test items used to measure learning from the lecture. Duell (1974, Note 3) demonstrated that the provision of instructional objectives in written instruction facilitated learning measured by verbatim items, but not paraphrase test items. This finding suggests an important limitation of instructional objectives as adjunct aids, namely that they facilitate the search/selection process in learning but do not influence deeper levels of encoding. The present study aimed to investigate this finding in a different instructional context.

Current research on instructional objectives has focused on student achievement with little emphasis given to attitudinal data. Yet in the design of instruction, it is important to know that our instructional strategies at a minimum have a neutral effect on student attitude. A single study has reported a more favorable student attitude to be associated with the inclusion of instructional objectives in a televised lecture (Tiemann, Note 2). The third purpose of this study was to attempt to replicate Tiemann's result with regard to attitude and objectives.

Method

Subjects

The subjects in the study were 60 undergraduate students enrolled in an introductory educational psychology class and par-

ticipated to fulfill a course requirement. Subjects were randomly assigned to one of four treatment groups so that each group was composed of fifteen students.

Materials

Lecture. A lecture on the principles and domains of learning was prepared for this study. The lecture simulated an actual classroom lecture, was expository in nature, and followed a Ruleg content sequence. With this type of lecture procedure, a defined concept or rule is presented, then an illustrative example or two is given. Finally, "lead-in" information for the next concept follows. For example, a definition of behavior was stated and succeeded by several illustrative examples of behaviors. Then a further distinction was drawn between overt and covert behaviors followed by a definition of these two related concepts. Eighteen related concepts were presented during the 40 minute lecture.

Objectives and Test Items. Twenty-three objectives were developed to coincide with the lecture; 14 required verbatim recognition and nine paraphrase recognition following Anderson's (1972) distinction between the two levels of test items. One multiple-choice test item was constructed for each verbatim objective and two for each paraphrase objective. A representative example for each objective type and its corresponding test item is presented below:

Verbatim Objective: The student will be able to recognize
the definition of discrimination.

Verbatim Item: A discrimination is established:

- (a) when different, but similar, stimuli come to control the same response.
- (b) when the learner can reproduce information provided for him/her.
- (c) when the learner can recognize new stimuli.
- (d) when similar, but different, stimuli come to control different responses.

Paraphrase Objectives: Given a previously unencountered example of discrimination the student will correctly identify it.

Paraphrase Item: Which of the examples below is an instance of discrimination?

- (a) Margaret touched a very hot beaker in chem lab and now she is afraid to handle any of the lab equipment.
- (b) Wine tasters demonstrate a capability to taste subtle differences in wine we would never notice.
- (c) Marty complained of a headache, so his teacher let him lay his head on the desk.
- (d) On a nature walk a small child mistakenly calls a butterfly a "bird".

A 28 item multiple-choice posttest was constructed from the 14 verbatim items and 14 of the 18 paraphrase items with at least one item for each paraphrase objective. The reliability of this test was determined to be .81 by the Kuder Richardson - 20 reliability formula.

Student attitude was measured with items from an instrument for the assessment of student attitude toward a specific period of instruction developed by Finch (1969) and additional items constructed by the present author. The instrument required students to respond to statements about the lecture on a 5-point scale ranging from strongly agree to strongly disagree. Alpha coefficient for this 21-item scale was .90. A representative sample of items from the attitude instrument are listed below:

1. I would like more instruction presented in this way.
2. This was a very good way to learn the material.
3. This mode of instruction held my interest very well.
4. This instruction was very boring.

Procedure

Four experimental groups were employed in the study with two of these groups receiving instructional objectives concurrently with the lecture, while the other two groups listened to the lecture without objectives. One of the objectives available groups was given the entire set of objectives 10-minutes prior to the lecture. The other objectives available group listened to the

lecture in two parts and received a subset consisting of half the objectives 10-minutes prior to each part. For the no objectives groups one listened to the lecture in one presentation, and the other group listened to the lecture in two presentations interspersed with a 10-minute interval. These two no objectives groups made possible the evaluation of a subsets presentation effect in a manner which would determine if it were due to interspersing a 10-minute interval in the lecture and not to the objectives.

The lecture was video-taped and presented simultaneously to all four treatment groups in four separate classrooms. The objectives available groups were informed that the objectives related to the lecture to which they were about to listen and that the objectives were indicators of the important material to be learned. Both the no objectives groups were given written directions telling them to attend to the lecture because they would be tested after listening to it.

Results

Achievement data were analyzed using a 2X2X2 ANOVA with repeated measures on one factor (test item type). These three factors were objectives/no objectives, continuous/interspersed lecture, and verbatim/paraphrase test items. The main effect for objectives was significant, $F(1,56) = 13.33$, $p < .001$, with the objectives groups scoring higher than the no objectives groups. The main effect for continuous/interspersed lectures was not

significant, $F(1,56) = 0.32$, $p < .05$, nor was the interaction of this variable with the objectives treatment, $F(1,56) = 1.94$, $p < .05$. This indicates that merely dividing the lecture with a 10-minute interval did not have a significant effect on overall retention of information from the lecture, but it also showed that presentation of objectives by subsets was no more effective than presentation by the entire set.

The main effect for test item type was significant, $F(1,56) = 13.59$, $p < .001$, with higher scores on verbatim items than on paraphrase items. Additionally, the interaction between test type and objectives was significant, $F(1,56) = 5.16$, $p < .05$. Table 1 presents the means and standard deviations of each treatment groups for both verbatim and paraphrase test items. A post hoc analysis of the cell means for this interaction was performed by the Newman-Keuls technique and yielded the following results:

1. subjects receiving objectives scored higher on verbatim items than subjects not receiving objectives
2. subjects receiving objectives scored higher on verbatim items than on paraphrase items
3. there was no difference in performance on paraphrase items for subjects receiving objectives and those not receiving objectives, and
4. there was no difference in performance on verbatim and paraphrase items for subjects not receiving objectives.

Analysis of the attitude scores by a 2X2 ANOVA showed two significant F-ratios. The main effect for objectives was significant, $F(1, 56) = 5.06, p < .05$, with the availability of objectives associated with a more positive attitude. The main effect for continuous/interspersed lectures did not reach significance, $F(1, 56) = 0.003, p < .05$. Next, the interaction of the objectives and continuous/interspersed lectures treatments was significant, $F(1, 56) = 11.63, p < .005$. (Table 2 presents the mean and standard deviation of each treatment group for attitude). Comparisons of cell means by the Newman-Keuls technique showed that the subjects receiving objectives by subsets had a significantly more positive attitude than either subjects receiving objectives by the total set or subjects who listened to the interspersed lecture without objectives.

Discussion

The present study tested four predictions concerning the effects of instructional objectives as an adjunct aid in learning from lecture. First, the inclusion of objectives with the lecture was postulated to result in greater learning from the lecture. Second, objectives presentation by subsets was predicted to facilitate performance more than presentation by the total set prior to the lecture. Third, it was stated that the provision of objectives would have an effect on performance measured by verbatim but not paraphrase items. Finally, the prediction was made that a more positive attitude would be associated with an instructional

presentation containing objectives than one without objectives. Data collected in the study supported all predictions, except the prediction concerning presentation of objectives by subsets.

The failure of the subsets presentation to improve the performance over total set presentation is incongruent with research employing written prose. One plausible explanation for this discrepancy is the means by which subsets presentation facilitates performance in learning from written prose. Kaplan (1974) reported that subsets presentation of objectives with written prose resulted in longer inspection time than total set presentation of the objectives. Apparently, the presentation of objectives by subsets with written prose facilitates performance by inducing the learner to study the information longer. Differential study time with subsets or set presentation of objectives was not possible with oral prose. Consequently no difference in performance was observed under these two conditions. This interpretation is in agreement with Faw and Waller's (1976) analysis of objectives and efficiency in learning from prose.

Learning from lecture was enhanced by the inclusion of objectives. This finding replicated those of Kaplan and Burgin (Note 1) and Royer (1977). Perhaps, more importantly it was found that performance on verbatim items was improved by the provision of objectives, but not performance on paraphrase items. This represents an extension of Duell's (1974, Note 3) findings with written prose to oral prose. Viewing paraphrase items as requiring a deeper level of processing and given the finding that objectives

did not result in higher performance on this class of items, then it can be concluded that objectives do not promote deeper levels of processing. An important limitation of this study in regards to this conclusion is that differences in performance cannot be attributed to the type of objectives. Both objectives groups received verbatim and paraphrase objectives. Therefore for this study it must be concluded that when students are given both types of objectives learning is facilitated only on verbatim items.

The incorporation of objectives into a lecture was found to be a simple instructional strategy that promoted a more positive student attitude under certain conditions. The present study suggests that objectives with a short instructional presentation engenders a more positive attitude, while objectives with a longer presentation resulted in significantly lower student attitude. Further research is needed to determine the optimal deployment of objectives with instructional presentation to maximize achievement and attitude.

Notes

1. Kaplan, R., & Burgin, E. M. Instructional objectives as an aid to learning from prose vs. videotaped instruction. Bell Telephone Laboratories, 1974.
2. Tiemann, P. W. Student use of behaviorally-stated objectives to augment conventional and programmed revisions of televised college economics lectures. Paper presented at the annual meeting of the American Educational Research Association, Chicago, 1968.
3. Duell, O. K. Overt and covert use of objectives of different levels. Paper presented at the annual meeting of the American Educational Research Association, New York, 1977.

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Table 1
Mean and Standard Deviation of Learning
Scores for Each Treatment Group

Group	Learning Score	
	Verbatim	Paraphrase
Objectives/Set Presentation	M=8.24 SD=2.17	M=6.59 SD=1.81
Objectives/Subsets Presentation	M=9.13 SD=1.96	M=6.73 SD=2.02
No Objectives/Continuous Lecture	M=7.65 SD=3.06	M=6.41 SD=2.03
No Objectives/Interspersed Lecture	M=6.17 SD=2.46	M=5.83 SD=1.79

Table 2
Mean and Standard Deviation of Attitude
Scores for Each Treatment Group

Group	Attitude Score
Objectives/Set Presentation	M=31.65 SD= 8.34
Objectives/Subsets Presentation	M=40.2 SD= 8.86
No Objectives/Continuous Lecture	M=34.06 SD=10.91
No Objectives/Interspersed Lecture	M=26.61 SD= 7.34